

Appl. No. 10/757,204
Amdt. dated 09/06/2006
Reply to Office Action of 06/09/2006

Attorney Docket No.: TS02-420
N1085-90169

Amendment to the Drawing

Please note the Amendment to Figure 1 as indicated in the attached replacement drawing sheet that includes both Figure 1 and Figure 2.

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REMARKS/ARGUMENTS

Claims 1-28 were previously pending in this patent application and each of claims 1-28 has been rejected. Claims 1, 5, 6, 8, 10-12, 14-17, 19, 21-23, 25 and 27 are hereby amended and claims 3, 4 and 24 cancelled. Applicants respectfully request re-examination, reconsideration and allowance of each of pending Claims 1-2, 5-23 and 25-28.

I. Drawings

The Office Action indicates that Figure 1 should be designated by a legend such as -- Prior Art --. Corrected drawings in compliance with 37 C.F.R. 1.121 (d) are filed herewith and the drawing amendment includes Figure 1 being designated by the legend -- Prior Art --.

The drawings are now in acceptable form.

II. Claim Objections

On page 2 of the subject Office Action, the claims were objected-to because "they include reference characters which are not enclosed within parenthesis". In particular, Applicants were directed to remove reference numbers, i.e. (SE) and (BB) in claim 1. Responsive to the claim objections, reference numbers and characters have been removed from the claims and therefore the objection to the claims should be withdrawn.

III. Claim Rejections – 35 U.S.C. § 112

On page 3 of the Office Action, claims 1, 12, 14, 21 and 23 were rejected under 35 U.S.C. § 112, second paragraph as being indefinite. In particular, the Office Action contends that the terms (n and k) and n and k values are unclear and that the recitation of "ARC" in claim 23 renders claim 23 indefinite.

Each of claims 1, 12, 14, 21 and 23 has been amended responsive to the suggestions in the Office Action and Applicants respectfully submit that each of claims

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1, 12, 14, 21 and 23 now complies with the requirements of 35 U.S.C. § 112, second paragraph.

The claim rejections under 35 U.S.C. § 112, second paragraph, should therefore be withdrawn.

5 **IV. Claim Rejections – 35 U.S.C. § 103**

On page 4 of the subject Office Action, claims 1, 3-6, 8-12, 14-17 and 19-28 were rejected under 35 U.S.C. § 103(a) as being unpathable over Prior Art of Present Invention, hereinafter "PAPI", in view of Pinaton et. al. (US Patent No. 6,141,103), hereinafter "Pinaton". Applicants respectfully submit that these claim rejections are
10 overcome for reasons set forth below.

Claims 1, 12 and 23 represent the independent claims of the claims rejected under 35 U.S.C. § 103 and each of independent claims 1, 12 and 23 has been amended and now recites distinguishing features not disclosed nor suggested in the PAPI or Pinaton. Both the admitted prior art (i.e. "PAPI") and the Pinaton reference
15 teach computing a thickness based upon measurements using spectroscopic ellipsometry. Each of amended independent claims 1, 12 and 23 recites the feature of:

independent of said performing, determining a thickness for
said . . . layer using an independent optical thickness
measurement component based on Beam Profile
20 Reflectometry or Beam Profile Ellipsometry.

Each of the PAPI and the Pinaton reference disclose providing and analyzing a combination of BPR (Beam Profile Reflectometry), BB (Broadband Spectrometer) and SE (Spectral Ellipsometer) data and computing a thickness therefrom. This is shown in feature 32 of Figure 6 of the present application. Pinaton discloses that "The present
25 invention is based upon a measurement by spectroscopic ellipsometry of the thickness and refractive index", col. 3, lines 30-32 and provides Figure 2 which provides all of the measurements being analyzed in computation unit 26. Neither the PAPI or Pinaton provide the feature of determining thickness using an independent optical thickness

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measurement component based on Beam Profile Reflectometry or Beam Profile Ellipsometry, i.e., independent of the spectral ellipsometer measurements and broadband spectrometer measurements, as in the claimed invention.

5 The feature of independently determining the thickness provides an improvement in speed and accuracy for determining values for optical constants n , refractive index, and k , extinction coefficient. As illustrated in Figures 6 and 7 and described in corresponding portions of the original specification, after experimental data is obtained, it is combined with a model of information on the film or film stack, and, at steps 36, 37 and 38 of Figure 6 or steps 53, 54 and 55 of Figure 7, a model of information on the film
10 or film stack is fitted to the experimental data until a best fit of modeling data to experimental data is obtained such as in step 37. This fitting of data may involve several iterations to obtain n and k values and the advantage provided by the claimed feature by the present invention, is that the experimental data output 50 (referring to Figure 7) is closer to the modeled data and therefore the fitting of the data that takes
15 place at steps 53, 54 and 55 of Figure 7 takes place more quickly and provides an improvement in accuracy compared to the prior art. Table 1 of the specification provides such an example of the improvement in accuracy.

Independent claims 1, 12 and 23 are therefore each distinguished from the Prior Art of Present Invention and Pinaton, and therefore the rejection of these claims under
20 35 U.S.C. § 103, should be withdrawn. Claims 5, 6, and 8-11 ultimately depend from claim 1, claims 14-17 and 19-22 ultimately depend from claim 12, and claims 25-28 ultimately depend from claim 23 with claims 3, 4 and 24 having been cancelled. As such, the rejection of claims 1, 3-6, 8-12, 14-17 and 19-28 under 35 U.S.C. § 103(a) as being unpatentable over the PAPI in view of Pinaton, should be withdrawn.

25 ***Dependent Claims 2 and 13**

On page 9 of the Office Action, claims 2 and 13 were rejected under 35 U.S.C § 103 (a) as being unpatentable over PAPI in view of Pinaton and further in view of

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Coates et. al. (U.S. Patent No. 4,826,321), hereinafter "Coates". Applicants respectfully submit that these claim rejections are overcome for reasons set forth below.

Claims 2 and 13 depend from claims 1 and 12 respectively, each of which is distinguished from the reference of Pinaton in view of the PAPI. The secondary reference of Coates has apparently been relied upon for providing measuring thin film thickness of a layer having the range of about 10 to 1500 angstroms and does not make up for the above-stated deficiencies of the PAPI and Pinaton. Claims 1 and 12 are therefore distinguished from the PAPI in view of Pinaton and Coates and because dependent claims 2 and 13 each incorporate the distinguishing features of their base claims, claims 2 and 13 are similarly distinguished. Therefore, the rejection of claims 2 and 13 under 35 U.S.C. § 103(a), should be withdrawn.

***Dependent Claims 7 and 8**

On page 10 of the subject Office Action, claims 7 and 18 were rejected under 35 U.S.C. § 103(a) as being unpatentable over the PAPI in view of Pinaton and further in view of Opsal et. al. (U.S. Patent No. 6,671,047), hereinafter "Opsal". Applicants respectfully submit that these claim rejections are overcome for reasons set forth below.

Claims 7 and 18 depend from claims 1 and 12, respectively, which are each distinguished from the references of Pinaton and the PAPI for reasons set forth above. Opsal has apparently been relied upon for teaching that it is known in the art to provide a critical point model otherwise as known as a harmonic oscillator approximation. Such does not make up for the above-stated deficiencies of the PAPI and Pinaton and therefore claims 1 and 12, and dependent claims 7 and 18, are distinguished from the PAPI in view of Pinaton and Opsal. As such, the rejection of claims 7 and 18 under 35 U.S.C. § 103(a) should be withdrawn.

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CONCLUSION

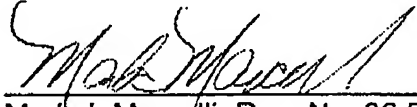
Based on the foregoing, each of pending claims 1-2, 5-23 and 25-28 is in allowable form and the application in condition for allowance, which action is respectfully and expeditiously requested.

5 The Assistant Commissioner for Patents is hereby authorized to charge any fees or credit any excess payment that may be associated with this communication to Deposit Account 04-1679.

Respectfully submitted,

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Dated: 06 SEPTEMBER 2006


Mark J. Marcelli, Reg. No. 36,593
Attorney for Applicant

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Attachment: Appendix with 1 replacement drawing sheet.

20 DUANE MORRIS LLP
101 West Broadway, Suite 900
San Diego, CA 92101
Telephone: (619) 744-2200
Facsimile: (619) 744-2201